

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.9
Ec 75 for

Foreign AGRICULTURE

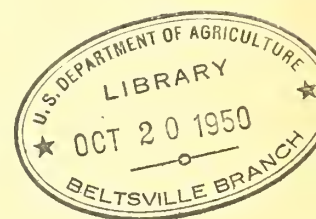
A REVIEW OF FOREIGN FARM POLICY, PRODUCTION, AND TRADE

VOLUME 9, No. 5

MAY 1945

IN THIS ISSUE

	Page
RECENT DEVELOPMENTS IN ITALIAN AGRICULTURE.....	66
The war years 1940-42.....	66
Effects of active warfare.....	69
Allied policies and programs.....	71
Agrarian unrest and reforms.....	72
Conclusions.....	74
WARTIME SHIFTS IN LATIN AMERICAN AGRICULTURE..	75
Mexico and Central America.....	75
Cuba and Hispaniola.....	76
Northwestern South America.....	77
Brazil.....	77
West-coast region.....	78
Rio de la Plata region.....	79



ISSUED MONTHLY BY OFFICE OF FOREIGN AGRICULTURAL RELATIONS
THE UNITED STATES DEPARTMENT OF AGRICULTURE . WASHINGTON, D. C.

Recent Developments in Italian Agriculture

by VICTOR B. SULLAM*

The present plight of Italy is that of a war-weary country which has also become a battlefield. The rehabilitation of Italian agriculture is hindered by a world-wide shortage of essential supplies and of shipping space. The city dwellers claim more food, whereas Italian farmers demand higher farm prices, and farm laborers seek agrarian reform.

In recent months valuable information, both on Italian agriculture during the war years and on the effects of military operations upon the production plant of the liberated portion of Italy, has become available to the general public. This information, though incomplete,¹ is sufficiently reliable² to warrant a preliminary analysis, which may bring some quantitative element into current discussions on agricultural problems in liberated areas.

The scope of this article will be confined to developments affecting agricultural production, without considering developments in such fields as international trade, internal distribution, and food consumption.

The War Years 1940-42

Italy entered World War II in June 1940 after several years of autarchic policy making and planning both in the industrial and in the agricultural field. No major shift in land use or change in crop pattern was required by wartime conditions; but, to maintain production at satisfactory levels, any decline in inputs of production means should have been avoided. Thus, developments in this field deserve first consideration.

*Office of Foreign Agricultural Relations.

¹ Most of the important statistics for 1943 and 1944 are lacking.

² The reliability of information, statistical and otherwise, supplied by Fascist sources has been seriously questioned in the past (14).³—"The authorities do not provide all the information that one might desire. . . . And such information as has been made available is biased by the spirit and purposes of the regime."

Yet, even under the Fascist regime, analysis of official statistics had led some courageous scholars to conclusions altogether unfavorable to Fascist policies. Instances of such studies are Barberi's work on food-consumption levels in Italy (2) and Demaria's essay on Italy's economic progress (5, pp. 151-187).

Allied officers, who examined the files of the Italian Central Institute of Statistics, found no evidence of tampering with wartime and pre-war data.

³ Italic numbers in parentheses refer to Literature Cited, p. 74.

MEANS OF PRODUCTION

The first indication of war-born dislocations in the Italian agricultural economy is to be found in statistics of farm supplies (table 1). Before the war Italy was wholly dependent upon foreign sources with regard to phosphates, and Allied operations in North Africa gradually deprived Italian agriculture of these most essential fertilizers. On the other hand, by 1939, Italy had become almost self-sufficient in nitrogenous fertilizer.⁴ During the war, and in spite of increased utilization of nitrogen for non-agricultural purposes, farm supplies of nitrogenous fertilizer remained at satisfactory levels. Consumption of potash, the least needed and least commonly used plant food, increased tremendously, reflecting mostly an increase in imports from Germany, and, to a much lesser extent, an increase in the small domestic output (from Sardinia and from sugar factories). Thus, not only the over-all supply but the proportion of the different plant foods was basically changed.⁵

TABLE 1.—Index numbers of supplies of fertilizers, insecticides, and fungicides available to farmers in Italy, 1939-42

[1936-38=100]

Products	1939	1940	1941	1942
Nitrogen.....	138	117	119	90
Phosphoric acid.....	121	106	76	50
Potash.....	99	247	258	230
Copper fungicides ¹	79	81	65	25
Sulfur.....	116	96	111	119
Iron sulfate.....	123	79	244	206
Arsenites.....	163	223	538	680
Arsenates.....	170	144	240	264
Carbon disulfide.....	104	98	62	40
Nicotine products ²	120	145	148	145
Pyrethrum.....	341	129	688	210
Rotenone.....	151	221	81	7
Fluosilicates.....	184	198	176	172

¹ In terms of copper sulfate.

² In terms of nicotine.

Calculated from official statistics by the Office of Foreign Agricultural Relations.

Italy's need for imported copper, the basic raw material for the preparation of the country's most

⁴ The fertilizer industry normally absorbed about 85 percent of the total domestic output of nitrogen.

⁵ From 2.35 tons of phosphoric acid and 0.13 ton of potash per ton of nitrogen (1936-38) to 1.3 and 0.34, respectively, for 1942.

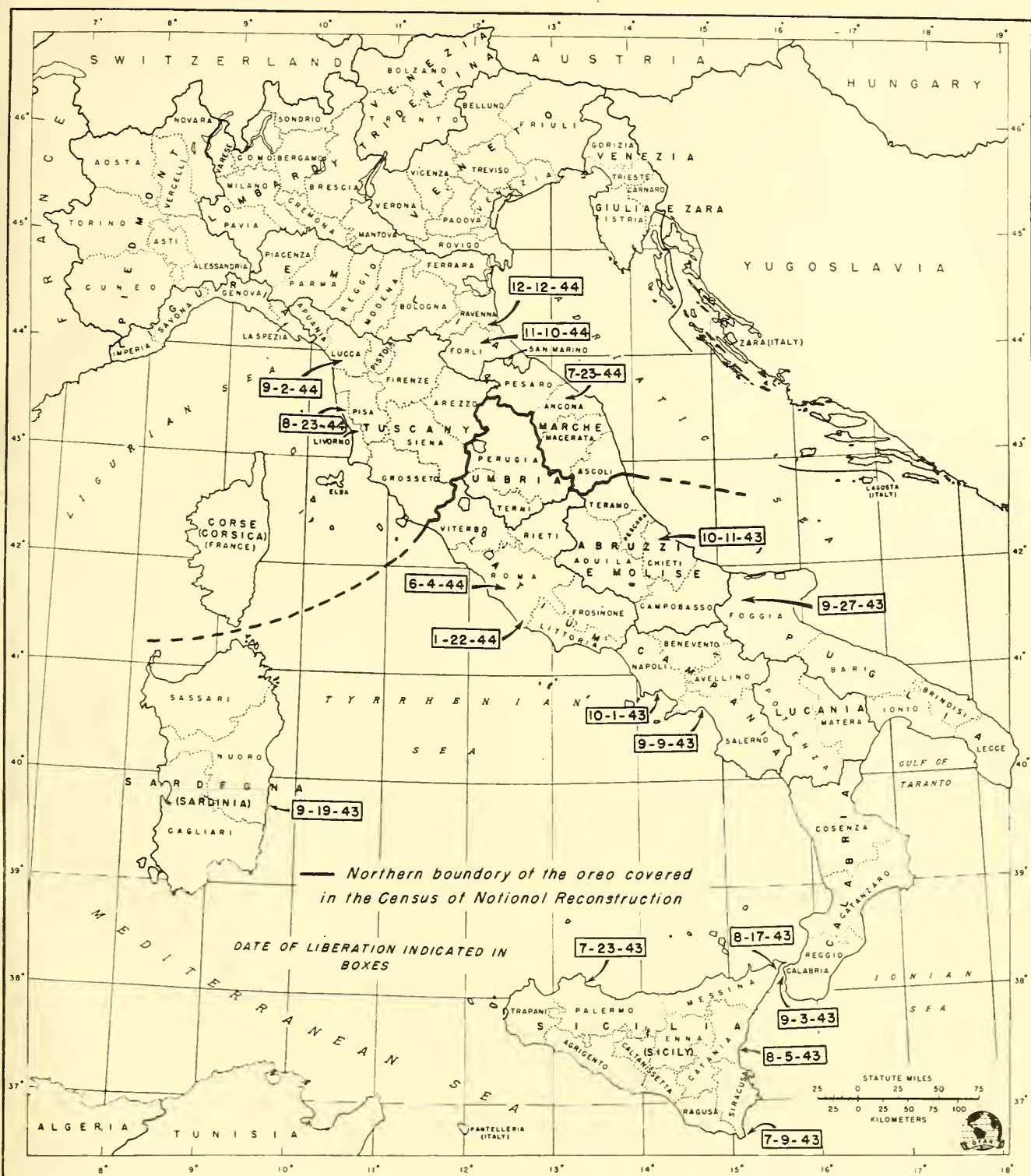


FIGURE 1.—Map of Italy showing northern boundary of liberated area covered by the 1944 Census of National Reconstruction.

important fungicides, had long been a cause of concern to Italian planners.⁶ During the war years, the

⁶ Copper fungicides represented 75 percent of the normal cost of plant and crop protection.

use of copper oxychloride and copper carbonate increased significantly, but the over-all supply of copper fungicides was well below pre-war levels. By 1943, the condition of the vines was a cause of major

concern. Moreover, inadequate disinfection of wheat seed had resulted in the spreading of the various smut diseases.

The situation with regard to insecticides is somewhat more complex. Farm consumption of carbon disulfide, practically the sole grain fumigant used in Italy, declined steadily, though total domestic production of this chemical was well maintained during the war. Consumption of arsenic compounds increased markedly. Supplies of pyrethrum fluctuated greatly from year to year. On the whole, wartime changes in the supply position for insecticides could have had only the most limited effects upon production.

With regard to seed material, Italy had achieved a high degree of self-sufficiency long before the war. Within the economic sphere of the Axis, the country not only found ever-increasing markets for its garden and meadow seeds, but also plentiful sources of those seed materials for which domestic production was qualitatively inadequate (seed potatoes) or perhaps inferior to imported produce (sugar beets).⁷ Conversely, during the war, Italian farmers seem to have depended less and less upon tested and selected seed material for grains and pulses, with consequent deterioration of the seed stocks.

Developments in the field of farm machinery are somewhat obscure, especially since there is no information at hand on wartime domestic manufacturing, and reliance must be placed upon estimates for annual turnover and import requirements. From the available information, apparently as early as during the late 1930's, tractor imports—which averaged 269 units in 1936-39—had fallen short of annual import requirements, then estimated at 1,000 units (18, p. 399). Between 1940 and 1942, Italy's annual net imports of tractors averaged 25 units. According to Italian specialists, by 1943 the Italian farm-machinery situation had so deteriorated that the post-war import requirements were estimated at 300 to 500 percent of pre-war for tractors, and 200 percent for plows.⁸ From scattered information on tractor numbers and fuel consumption during the war, by 1942 mechanical motors may be estimated to have performed one-half as much farm work as in 1938.

The situation with regard to animal power is diffi-

cult to analyze. A comparison of the 1941 and 1942 censuses of livestock with pre-war estimates of the livestock population (table 2) indicates that the decline in the number of horses, mules, and asses might have been compensated for by an increase in number and in use of draft cattle. Army demands for mules and horses must have impaired the power supply in the south and in the isles; that is, in the very areas where shortages of mechanical and animal power were a serious hindrance to agricultural exploitation (19). The over-all performance of animal and mechanical motors in 1942 may have amounted to 90 percent of that of pre-war years.⁹

TABLE 2.—Number of livestock in Italy, 1938-42¹

Type	1938	1939	1940	1941	1942
	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
Horses	791	781	761	743	769
Mules	431	432	414	319	312
Asses	796	789	789	679	682
Cattle: Total	7,685	7,957	8,228	8,501	8,384
Cows	3,828	3,907	3,986	3,924	3,872
Goats	1,852	1,825	1,797	1,770	1,727
Sheep	9,496	9,607	9,718	9,829	9,422
Swine	2,940	3,303	3,212	3,645	3,725

¹ Based on official estimates, dated March 19, for 1938 to 1940 and on the two censuses of June 30, 1941, and July 20, 1942. Excluding animals belonging to the army and those in transit at date of census. Numbers of cows, cattle, goats, and sheep from 1938 to 1940 adjusted for seasonal factors and underestimation in official sources.

Office of Foreign Agricultural Relations.

For a complete appraisal of the agricultural situation, consideration should be given to the supply of farm labor. Not only did Italian farms supply a large proportion of the Army personnel,¹⁰ but also from the ranks of the agricultural population came many of the workers sent to Germany, as well as those that found new employment in factories. The decrease in farm labor may be tentatively approximated at about 20 percent. The effects of a reduction of this magnitude are difficult to appraise. On the one hand, the Fascist regime, as is generally recognized, had through legislative and other measures forced a degree of overemployment in agriculture. On the other hand, the agricultural economy of the country was based on a plentiful supply of cheap labor so that a reduction in farm manpower must have caused some dislocation, especially because the means for increasing mechanization or, more generally, the efficiency of labor utilization were inadequate or lacking.¹¹

⁷ Because of climatic conditions, the Mediterranean lowlands of Italy must depend upon outside sources for seed potatoes; estimates indicate that foreign countries normally supplied some 5 percent of seed requirements. In 1937 Italy had become self-sufficient with regard to sugar-beet seed, but domestic seed was still frowned upon.

⁸ *Neue Zürcher Zeitung*. "Nachkriegsprobleme der Italienischen Landwirtschaft," April 13, 1943.

⁹ For a synthesis of the pre-war power situation in Italian agriculture, see (16).

¹⁰ In 1943, the number of men in the Army equaled that of 1917.

¹¹ The size of labor input in peacetime is estimated at 14 billion man-hours by Vitali (19, p. 247) and at 15.7 billion man-hours by Angelini (1). According to these estimates, human labor may have contributed from 12 to 13 percent of the total kilowatt-hours employed in agriculture.

LAND USE, ACREAGE, AND YIELDS

Wartime production plans for Italian agriculture called for only minor changes from the pattern of land utilization established during the last peace-time years as a result of autarchic policies. Moreover, except for some conspicuous increases in the acreage planted to industrial crops, the variations registered for major crops (wheat, corn, and other grains) are essentially the result of war-caused dislocations rather than of attempts to achieve definite goals.

The outstanding wartime phenomenon is the crisis in Sicilian and southern Italian agriculture, indicated by a decline of the acreage under cultivation and a reversion from a pulse-grain rotation to the less productive fallow-grain succession. The causes of the decline in pulses are to be sought in the shortage of draft animals, which is especially felt in the fall (the planting season both for small grains and for field beans), and of phosphate fertilizer, which is essential to ensure adequate returns from the pulse enterprise. (See table 3.) Again, the steady increase in the barley acreage indicates a reversion to more primitive forms of grain farming. Shortages of fertilizer, especially phosphate, and other war-caused dislocations were of such nature that their effect could be felt only with some delay. Yet, for the country as a whole, crop yields began, in 1942, to give a clear indication of war-weariness (table 4). In 1943, a disastrous drought greatly enhanced the adverse effects of fertilizer shortages. Reduced production, together with the dislocations that attended political and military events in the summer and fall of 1943, brought to Italy one of the worst food crises of its recent history.

TABLE 3.—Acreage of specified crops in Italy, average 1936-38, annual 1939-43

Crop	1936-38	1939	1940	1941	1942	1943	Per-centage change from 1936-38 to 1943
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Per-cent
Wheat.....	12,634	12,918	12,543	12,281	12,795	13,235	+5
Rye.....	259	259	259	264	262	252	-3
Barley.....	487	497	502	511	618	670	+38
Oats.....	1,082	1,038	1,092	1,100	1,097	1,132	+5
Rice, paddy.....	361	388	403	413	398	376	+4
Corn, spring.....	3,234	3,153	3,296	3,170	3,111	3,027	-6
Horsebeans.....	1,614	1,611	1,552	1,416	1,226	1,253	-22
Potatoes.....	1,048	1,055	1,060	1,112	1,144	(?)	-----
Sugar beets.....	324	363	427	373	366	(?)	-----
Hemp.....	205	225	227	245	215	(?)	-----
Cotton.....	57	94	158	193	84	(?)	-----

¹ Data incomplete.
² No data.

Compiled from official statistics by the Office of Foreign Agricultural Relations.

TABLE 4.—Index numbers of yields per acre of specified crops in Italy, 1939-43

Crop	1939	1940	1941	1942	1943
Wheat.....	105	96	97	87	82
Rye.....	109	110	104	102	94
Barley.....	101	95	100	79	73
Oats.....	99	98	100	83	73
Rice, paddy.....	91	100	96	94	86
Corn, spring.....	83	109	86	83	161
Horsebeans.....	104	66	72	65	59
Potatoes.....	94	111	101	94	(?)
Sugar beets.....	104	127	115	104	(?)
Hemp.....	106	109	104	89	(?)
Cotton.....	90	75	65	65	(?)

¹ Partially estimated.
² Data incomplete.
Calculated from official statistics by the Office of Foreign Agricultural Relations.

Effects of Active Warfare

With the Allied landing in Sicily (July 9, 1943) and in Calabria (September 3), Italy became the theater of ground fighting, which was preceded and attended by an intensification of aerial warfare. Until the landing at Salerno (September 9), the Allied Armies advanced speedily, and fighting centered in a few localities, Sardinia and southern Puglia witnessing no ground action. Thereafter, most of the ground was bitterly contested. Moreover, after the signing of the Italian Armistice, the Germans adopted a scorched-earth policy which gained momentum as the lines of battle moved northward. Sicily, Sardinia, and that part of the Italian boot which lies south of Foggia and Salerno suffered comparatively little damage, but, in the other liberated areas, the war exacted a heavy toll from agriculture.¹² Thus, fighting and scorching were concentrated in areas where agriculture was more advanced and more dependent upon such man-made improvements as drainage, irrigation, rural electrification, etc.

A special census, taken in September 1944,¹³ attempted to measure both the over-all damage suffered by the Italian economy and that part of it which can be directly attributed to German plundering and scorching. The census covered Liberated Italy within the northern boundaries of Latium, Umbria, and Abruzzi, thus excluding some of the most bitterly

¹² The damage suffered by other sectors of the economy is not necessarily proportional to that wrought in agriculture. For instance, while Sardinian agriculture appears well-nigh intact, Cagliari, the capital of the island, has suffered tremendous damage to residential housing as a result of aerial bombardment.

¹³ Census of National Reconstruction, provided for by a decree of September 21, 1944. It includes an enumeration of livestock and farm machinery, data on damage to farm dwellings and other farm buildings, on livestock killed and seized by the Germans, on farm machinery destroyed, and on land withdrawn from cultivation because of flooding, mining, or military (that is, Allied) occupation.

contested areas. Though it is not clear to what extent partial returns and press releases on the census can be relied upon, a few statements on the extent of war damage seem warranted.

Through the removal or crippling of drainage pumps, the obstruction of canals, and the destruction of levees, the Germans flooded a sizable portion of the drainage districts of Campania and Latium, including one-half of the floodable area of the Pontine Ager. Though the flooded area comprises a small percentage of the productive land of Liberated Italy, the comparative ease with which the Germans accomplished the scorching of the drainage districts is some indication of what may take place on the irrigated plains and land-reclamation areas of the Po Valley, where much of Italy's agricultural wealth is centered.

Partial surveys indicate that land mines are a greater hindrance to resumption of agricultural production than flooding. In fact, both in Italy as a whole and in most other fought-over areas, land mines loom as a major problem, for they are, or may be, scattered all over the countryside and may continue to exact a heavy toll in terms of human lives, livestock losses, and of immobilization of the production plant for some time to come. As long as Italy remains a base for operations, the military will occupy wide areas of land for airfields, dumping grounds, ground and aerial ranges, etc.

Trees and vines have suffered little from military operations. Even in the war-ravaged Province of Littoria, only 12 percent of the olives and 17 percent of the vines have been destroyed.¹⁴ The damage to farm buildings is much less than that to urban housing, except for silos, many of which, because of the towerlike construction so popular in Italy, are most vulnerable. The destruction of farm machinery, gaged from incomplete data, has been relatively small, tractors being lost in the largest numbers.

In no other sector of the agricultural economy have fighting, German scorching, and war-borne dislocations wrought more havoc than in animal husbandry. The damage suffered has been tentatively estimated on the basis of partial census releases (table 5). Obviously, losses of livestock have been light in areas where little fighting took place and quite heavy in the northern Provinces. The Liberated Provinces beyond the northern boundaries of the census area seem to have suffered even greater losses.¹⁵

¹⁴ Conversely, Littoria appears to have lost practically all of its forests.

¹⁵ According to the *Osservatore Romano* for Jan. 13, 1945, Tuscany lost 36 percent of its cattle, 37 percent of its equine animals, and 18 percent of its sheep. Severe losses are also reported in the fought-over Provinces of Ravenna, Forlì, and Pesaro.

TABLE 5.—Livestock numbers in liberated areas of Italy¹ covered by the 1944 census, 1942, and percentage decline 1944

Type	1942 ²		1944
	Number	Percent- age of total Italy	Esti- mates ³ of percent- age de- cline from 1942
	Thousands	Percent	Percent
Horses.....	351	45.6	10-20
Mules.....	265	84.7	10-20
Asses.....	509	74.6	10-20
Cattle.....	1,684	20.1	25-35
Sheep.....	7,049	74.8	20-30
Goats.....	1,370	79.3	15-20
Swine.....	1,444	38.8	20-30

¹ Northern boundary as per map (fig. 1).

² Official statistics.

³ Tentative estimates by the Office of Foreign Agricultural Relations based on press releases and other incomplete data.

The total loss is severe not only in terms of capital wealth, or in reduced output of animal products,¹⁶ but also in terms of decline in the productive capacity of Italian agriculture, for in Italy livestock represents the main source of farm power. The losses suffered by the livestock population may reduce the supply of animal power by as much as 20 percent. Moreover, cattle losses are higher in those very areas where cattle are the main source of power and horses and mules are relatively unimportant. From the standpoint of livestock improvement, the heavy reduction in the dairy herds (of Carnation Holsteins and Brown Swiss) around Rome and in the Tuscan cattle herds may have wiped out the work of many years.

Both fertilizer and agricultural processing plants have been heavily damaged. For instance, no sugar factory was left in working condition so that the sugar-beet crop was a total loss.¹⁷ Much of the nitrogen industry was brought to a standstill for want of electric power, and in many parts of Central Italy the Germans dismantled the lead chambers of the superphosphate plants.

When account is taken of the damage indirectly wrought in agriculture by the destruction of transportation, it clearly appears that the losses suffered by the agriculture of Liberated Italy in 1943-44 exceed those of the northern Provinces during the war of 1915-18.¹⁸

¹⁶ Estimates indicate, for instance, that the production of Pecorino cheese may be reduced by at least 30 percent (*Il Globo*, Feb. 10, 1945).

¹⁷ This happened both in 1943 for the crop of Southern Italy and in 1944 for the crop of Central Italy; the estimated total loss may have amounted to some 33,000 short tons of sugar.

¹⁸ Military operations during World War I hit an area of 4.4 million acres; over 300,000 acres were flooded or had their drainage impaired. Livestock losses amounted to 400,000 animal units.

Allied Policies and Programs

The basic criteria guiding Allied policies in Italy are clearly set forth as follows (9, pp. 10-11):

Basic economic policy of the Allies is to revive economic life and stimulate production in order to reduce to a minimum the needs of Italy from the Allies and to develop Italy as a source of supply for further operations.

The question as to what is best for Italian agriculture from a long-term policy viewpoint is not a strong factor under war conditions when shipments of civilian supplies must be justified in detail in terms of developing self-sufficiency in food and livestock.

... emergency rehabilitation measures may be undertaken if they will lighten the relief-import burden during the emergency period. Supplies must not be requisitioned for reconstruction programs that will bear fruit only after an extended period of time.

The over-all criterion of essentiality ... is that of saving shipping space and conserving essential Allied supplies ... the import of a few tons of parts of drainage or irrigation machinery [that] would result in the production of large quantities of essential foods that would otherwise have to be imported [is justified].

Under these basic policies, the Allied programs affecting agriculture become essentially a matter of restoring production facilities, providing essential supplies, and encouraging agricultural production to serve the needs of the civilian population, the armed forces, and the United Nations.

The rehabilitation of the production plant is a difficult task:¹⁹

Had such ravages and such destruction of capital equipment of every kind taken place as the result of some natural phenomenon—earthquake or tidal wave—even a peaceful world with its full production available and all its shipping facilities at hand to bring remedial measures would have found it a long and laborious process to repair them. Not only is there the havoc of bombs and artillery, but, much more serious, of enemy demolition.

But the resources of the Allied Nations are needed to the utmost for war needs. Shipping, however rapidly built, on however great a scale, is devoured by the hungry jaws of war both in the East and the West. At the same time the liberated areas of France, Belgium, and Holland make insistent demands for help.

It is natural, therefore, that with all the goodwill in the world the process of reconstruction in Italy is tedious and slow.

The gap between requirements and available supplies may be conveniently illustrated by taking Sicily as an example: During the current crop year, the superphosphate available to Sicilian farmers²⁰ will amount to 5.5 percent of the 1936-40 average consumption, and 7.2 percent of the requirements for

essential crops.²¹ A similar situation obtains with regard to nitrogenous fertilizer. Available supplies of fungicides are also below current requirements. Again, of a minimum requirement of 6,300 tons of seed potatoes for Campania, only 3,600 short tons were available in time for winter planting.²² Finally, with regard to farm machinery, one of the most urgent needs of Liberated Italy, no imports were made during 1944.

As for draft animals and other livestock for which relief imports seem out of question, the sole feasible remedy consists of transfers from less damaged areas to the war-torn Provinces. According to plans drawn up in Rome, in October 1944, such transfers, up to June 1945, should involve over 30,000 head of cattle, 6,000 horses, and 50,000 sheep. A number of practical difficulties, however, made the transfer of more than 25 percent of the draft animals in time for spring planting impossible. Moreover, less than one-tenth of the planned transfers of sheep had materialized up to the end of 1944.²³

In order to husband carefully the limited resources available, crops have been given a priority rating, which determines preference in the assignment of supplies and materials (seed, farm machinery, fertilizers, etc.) of either domestic or foreign origin. Food grains, potatoes, dry legumes, and hemp receive first priority, followed by sugar beets, vegetables of high nutritive value, oats, and forage crops. The third priority rating is reserved for tobacco, such vegetables as peppers and asparagus, most deciduous fruits, grapes, and lemons. Finally, the lowest priority is assigned to other citrus fruits, flax, and cotton (9, p. 15).

Crop priorities indicate general directives for agricultural production; but, both in the formulation and in the achievement of planting goals, the adverse effect of supply difficulties and war-caused dislocations is being felt. For instance, the shortage of fertilizer makes advisable a partial replacement of wheat with barley, which, though less desirable from the standpoint of food production, is a less demanding crop. Again importation and interregional movements of seed potatoes are so difficult that production of this most desirable commodity not only cannot be expanded but, most likely, will be seriously curtailed. Above all, the shortage of draft power, on the one hand, forces a revision of planting goals

²¹ Calculated from the 1944-45 Production Program (9), considering as high-priority crops all grains, pulses, vegetables (including potatoes), flax, tobacco, cotton, and oilseeds.

²² *Il Domani d'Italia*, February 8, 1945.

²³ DE SIMONE, V. SOME ASPECTS OF THE RECENT PROBLEMS AFFECTING LIVESTOCK. Report to the Second Agricultural Conference, Rome. January 23-25, 1945.

¹⁹ Declarations of Harold McMillan, acting president of the Allied Commission in Italy, quoted in *Italy Today*, Italian News Bulletin, OWI Foreign Language Division, January 5, 1945.

²⁰ *Giornale di Sicilia*, November 5, 1944.

that may be in conflict with crop priorities and, on the other hand, may even jeopardize the realization of the revised goals.

The shortage of draft power is felt especially in the fall, the season when most crops are sown, and when sound husbandry further demands that the ground be also tilled for the deep-rooted, spring-sown crops (sugar beets, tobacco, hemp, corn, etc.). Yet the supply of power is so inadequate that ground preparation cannot be completed even for the fall-sown crops. To achieve a more equal distribution of power requirements between the fall and the spring, recourse was had to some sowing of wheat in February. Fortunately, some spring wheat was available in areas where February sowing is a customary practice (for example, Sicily). In other areas, improved varieties of winter wheat—principally the hybrid Mentana—were to be planted as late as February. On land that would otherwise remain idle, legumes will be sown to the south and corn to the north. Corn will also be used partially to replace sugar beets.

The effect of these and other adverse factors upon crop planting in 1944-45 is clearly evinced by the acreage goals recently established by Allied and Italian officials. These goals definitely show that even a comparatively primitive agriculture, though little dependent upon modern means of production, and

though strong in the courage and tenacity of millions of peasants, cannot speedily recuperate its productive capacity. Furthermore, the goals present too favorable a picture of the situation, because, although they have been revised downward in the light of the latest planting reports, their final achievement is still questionable (table 6).

The over-all decline in productive capacity can be appraised only with extreme difficulty, and it may, as happened in 1944, be partially offset by favorable weather conditions. As a general indication, it may be pointed out that the 1945 forecast for wheat, the main crop and the staple food of the liberated areas of Italy, is about 65 percent of the 1936-38 average and about 85 percent of the 1944 harvest.

Agrarian Unrest and Reforms

By the force of circumstances, Allied and Italian administrators cannot confine their activities to the handling of supply and production problems; to prevent unrest, at least temporary solutions must be found for complex social problems. Any change in the special structure of agriculture, however, must be weighed in the light of its effect upon agricultural production. An example of such problems is the question of land reform:

The peasants are hungry for land and in the past advantage has been taken of this hunger to lead the Italians into ruinous adventures. The adventures have failed and the hunger remains. Around the land are centered the discussions of the experts and the programs of the [political] parties. It is easy to see how in these programs there is an interplay of economic, social, and political motives. From an economic standpoint the land is the sole factor of production, that remains almost unaffected [by war].

This quotation from a political weekly²⁴ summarizes what constitutes the main cause of agrarian unrest. The land problem makes the comparatively well-fed rural areas a center of dissatisfaction and unrest, fraught with as much danger as the starved urban areas.

Throughout the extensively farmed areas of Sicily, Southern Italy, and Latium, where the large holdings, the so-called *latifundia*, prevail, there is an open conflict between the peasants on the one side and the owners and renters of large estates on the other. The operators of large estates tend to reduce the acreage planted to field crops (beans and wheat) and to expand livestock raising (cattle, horses, mules, and sheep), principally because animals either for slaughter or for draft would ensure the large operators greater returns per unit of land. Conversely,

TABLE 6.—*Acreage of major crops in Liberated Italy,¹ 1938 and 1942, and goals for 1945*

Crop	Acreage harvested ²		Goals for 1945 ³		
	1938	1942	Acreage	Percentage of	
				1938	1942
	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>1,000 acres</i>	<i>Percent</i>	<i>Percent</i>
Wheat.....	10,074	10,299	8,648	86	84
Barley.....	462	578	544	118	94
Rye.....	64	62	59	92	95
Corn.....	1,769	1,658	1,586	90	96
Rice.....	27	27	25	93	93
Oats.....	996	983	976	98	99
All grains.....	13,392	13,607	11,838	88	87
All pulses.....	2,911	2,449	2,170	75	89
Potatoes.....	739	776	667	90	86
Tomatoes.....	111	119	128	115	108
Other vegetables.....	326	341	346	106	101
All vegetables.....	1,176	1,236	1,141	97	92
Sugar beets.....	178	195	153	86	78
Tobacco.....	67	494	79	118	84
Hemp.....	208	190	153	74	81
Cotton.....	92	84	32	35	38
Fiber flax.....	12	7	7	58	100
Oilseeds.....	25	69	40	160	58
All industrial crops.....	582	639	464	80	73
Forage crops ⁴	5,935	6,217	5,325	90	86
Total.....	23,996	24,148	20,938	87	87

¹ Includes the Compartment of Emilia (fig. 1).

² Official statistics.

³ Based on 1944-45 Production Program (9) and revised in the light of planting reports.

⁴ Estimated.

⁵ Rotation meadows and cover crops.

²⁴ *Domnica*, October 7, 1944.

the peasants, who do not share in the livestock enterprises and are solely concerned with grain and pulse production, demand that no land be left idle, either for pasture or for fallow, and stress the fact that, because of the decreased productivity of the soil, a peasant family must cultivate a greater-than-normal acreage of field crops to earn its livelihood. In the more intensively farmed areas of Central Italy and of the coastal fringe in the south, the demands of the peasants are essentially aimed at a revision of share-tenancy agreements, which would reduce the landlord's share of the gross produce and, eventually, increase his share of the production costs.

The present-day causes of unrest and the peasants' claims are identical with those of the period immediately following World War I.²⁵ While at that time both Government and landowners acceded, at least temporarily, to most of the requests of the well-organized peasantry, today the Government must be primarily concerned with the effect of reforms upon size of production and crop-collection programs.

In the meantime, the peasants have attempted to occupy some of the large estates from Calabria to Latium, and the police have been called upon to maintain law and order.²⁶ Simultaneously, the sharecroppers of the areas of intensive farming have pressed their claims for a revision of crop-sharing agreements.

With regard to such agreements, provision has now been made for local revisions to be agreed upon by tenant and landlord organizations. Some of these revisions, which significantly increase the tenant's share of the crop, are already in force.

For the areas of extensive farming, recently enacted legislation²⁷ allows—

associations of peasants, regularly established as cooperatives or other bodies . . . to obtain the grant of land, privately or publicly owned, which appears idle or inadequately cultivated on the basis of its characteristics, the local conditions of agriculture and the cultivation requirements of the holding in relation to the needs of the agricultural production of the country.

²⁵ The years immediately following World War I were years of considerable agrarian unrest. In 1920 one out of every six agricultural laborers took part in strikes (15, p. 268), man-days lost through strikes amounting to over 14 million days as compared with about 480,000 in 1914. Estimates of the total area of land "invaded" vary from about 100,000 to 500,000 acres (14, p. 30); however, if allowance is made for the fact that in most cases the invasion merely meant the hoisting of a red flag on the central buildings of the estates (12, p. 34), it may be assumed that no more than 124,000 acres of land were actually seized by the peasants. Little over half of the land seized was later given under temporary grants to peasant cooperatives (6, p. 199).

²⁶ The timing of the "invasion," identical to that of the land seizures of the 1919-21 period, is significant, for it coincides with the sowing season for small grains and horsebeans.

²⁷ Legislative Decree of the Lieutenant General of the Realm, October 19, 1944, No. 279 (10, pp. 493-494).

Moreover, estates sequestered under the legislation against Fascist criminals²⁸ may be entrusted to cooperatives of peasants that are considered to be able to maintain the productivity of the holding. Applications for such grants are passed upon by a joint commission headed by a magistrate and comprising one representative each for the landlords and the peasants. The duration of the grant cannot exceed four crop years. Land granted to peasant associations cannot be subleased or otherwise given to other parties. Conflicts between landlords and peasants with regard to compensation to the former are to be settled by the special commission.

This legislation presents many significant features. It is essentially similar, in form and content, to decrees enacted after the last war and repealed by the Fascist regime to pacify the peasants and to stimulate direct food production on the latifundia.²⁹ Again the basic tool of agrarian reform is sought in those landholding cooperatives that have long represented one of the most remarkable phases of agricultural cooperation in Italy.³⁰

Under the new legislation, cooperatives continue to perform their traditional task of replacing the middlemen who normally rent the latifundia for cash and, eventually through further middlemen, sublease portions of the estate to peasants, handling other portions under sharecropping agreements. Depending upon local conditions, the cooperatives either operate the land jointly or allot it among their members. In any event, the economic status of the peasants will be improved, without any adverse effect upon production.

The legislation regarding idle land, however, cannot be expected to bring about the end of the latifundia, or, even under the most favorable conditions, substantially to change current methods of farm operation. A substantial number of large estates are not likely to be considered idle or ill-cultivated; therefore the total amount of land granted will be

²⁸ Under a Legislative Decree of the Lieutenant General of the Realm, July 7, 1944, No. 159 (10, pp. 259-265), wealth accumulated from "participation in, or adherence to, the Fascist Regime is transferred to the State."

²⁹ See Serpieri (15, p. 283) and Schmidt (14, p. 31). Orsenigo (12) indicates that recovery of production was one of the main effects of such legislation.

³⁰ For a description of such cooperatives, see (7, 3, and 4). Most authors agree that at their peak such cooperatives operated some 370,000 acres of land. However, Ruini (13, p. 27) and Schmidt (14, p. 30), who estimate the number of cooperatives at more than 300, seem to fall far short of the truth. According to available statistics, Catholic cooperatives alone numbered 331, Republican and Socialist cooperatives 236, and cooperatives of war veterans 84. The estimate of little less than 700 landholding cooperatives—for 1921-22—made by Serpieri (15, p. 452) seems substantially correct. By 1925 the number of cooperatives had been halved. In 1938 the landholding cooperatives were 221 and operated 168,351 acres (8, p. 445).

small.³¹ Nor can the latifundia be reformed by mere changes in ownership or possession, for the creation of an intensive agriculture is contingent upon the provision of water for man, beast, and crops, upon road building, resettlement, etc. (11, p. 348). With time and credit, some peasant cooperatives have proved in the past their ability to triumph over all obstacles and to convert abandoned latifundia into rich farms.³² The reborn cooperatives of today, with proper leadership and public support, may help to maintain agricultural production now; in the future they may help to achieve better farming and a fuller life for the disadvantaged sectors of Italian agriculture.

Conclusions

The efforts of Allied and Italian authorities and of Italian farmers to restore agricultural production can meet with only a limited degree of success as long as adequate supplies of essential production implements (fertilizer, tools, farm machinery, etc.) are lacking to the farmers, and as long as inadequacy of transportation facilities is the main obstacle to efficient utilization of domestically available resources. The shortage, or lack, of certain means of production, especially fertilizer, is being felt more and more and cannot be compensated for by any amount of human exertion. Although, in the past, inadequate control of distribution has been the principal cause of food shortage in the urban centers of Italy, in the immediate future, the decline of agricultural production can greatly aggravate Italian relief problems.

Guerilla warfare, between the Partisans and the Germans, and German plundering have already caused considerable damage to the production plant of Northern Italy. If, in addition, the Germans should carry out extensive scorching operations in the irrigation and drainage areas, Northern Italy, upon liberation, may be found to have suffered even greater damage to agricultural-production capacity than the war-ravaged areas to the south.

Literature Cited

(1) ANGELINI, FRANCO.

1935. *IL LAVORO NELL'AZIENDA AGRICOLA CORPORATIVA*. 50 pp., illus. Rome.

³¹ There is no indication of such grants having taken place in Sicily, where most of the latifundia are located, and where, on the other hand, the landed proprietors greatly influence political and social developments.

³² For instance, Vacirca (17, p. 264) states that the estate Pietra di Piazza of 3,500 acres, purchased in 1925 by the Cooperative "La Provvidenza" of Gela, was, in a short time, converted into vineyards, almond and olive orchards, and equipped with processing facilities and farm dwellings. Its value is estimated to have increased five-fold over a period of 15 years.

(2) BARBERI, BENEDETTO.

1939. *INDAGINE STATISTICA SULLE DISPONIBILITÀ ALIMENTARI DELLA POPOLAZIONE ITALIANA DAL 1922 AL 1937*. [Italy] *Ann. di Statis.* (VII) 3: 5-98, illus.

(3) COLE, WILLIAM E., AND CROWE, HUGH PRICE.

1937. *RECENT TRENDS IN RURAL PLANNING*. 579 pp., illus. New York.

(4) COSTANZO, GIULIO.

1923. *THE PRINCIPAL TYPES OF AGRICULTURAL COOPERATIVE SOCIETY IN ITALY*. *Internatl. Rev. of Agr. Econ.* (n. s. 1) 1: [59]-80, illus.

(5) DEMARIA, GIOVANNI.

1942. *IL PROBLEMA INDUSTRIALE ITALIANO*. *In Ricostruzione dell'economia nel dopoguerra*. 258 pp., illus. Padova.

(6) FRAUENDORFER, SIGMUND VON.

1942. *AGRARWIRTSCHAFTLICHE FORSCHUNG UND AGRARPOLITIK IN ITALIEN*. 307 pp. Berlin.

(7) HOBSON, ASHEL.

1926. *THE COLLECTIVE LEASING AND FARMING OF LAND IN ITALY*. *Jour. Land and Pub. Util. Econ.* 2: [67]-72, illus.

(8) ISTITUTO CENTRALE DI STATISTICA DEL REGNO D'ITALIA.

1940. *ANNUARIO STATISTICO DELL'AGRICOLTURA ITALIANA, 1936-1938*. 529 pp., illus. Roma.

(9) ITALIAN MINISTRY OF AGRICULTURE AND FORESTS AND ALLIED COMMISSION.

1944. *1944-45 PRODUCTION PROGRAM FOR ITALIAN AGRICULTURE, FORESTRY AND FISHERIES*. 190 pp., illus. Rome. [In Italian and English.]

(10) [ITALY] MINISTERO DI GRAZIA E GIUSTIZIA.

1944. *GAZZETTA UFFICIALE DEL REGNO D'ITALIA*. (ser. spec.) 85: 259-265; 493-494.

(11) LORENZONI, GIOVANNI.

1923. *LATIFUNDIA IN SICILY AND THEIR POSSIBLE TRANSFORMATION*. *Internatl. Rev. of Agr. Econ.* (n. s. 1) 1: [316]-349.

(12) ORSENIGO, LUIGI.

1921. *NOTE SULL'INVASIONE DELLE TERRE IN SICILIA*. *Ital. Agr.* 58: [33]-40, illus.

(13) RUINI, MEuccio.

1922. *THE ITALIAN CO-OPERATIVE MOVEMENT*. *Internatl. Labour Rev.* 5: [13]-33.

(14) SCHMIDT, CARL T.

1938. *THE PLOUGH AND THE SWORD*. 197 pp., illus. New York: Morningside Heights.

(15) SERPIERI, ARRIGO.

1930. *LA GUERRA E LE CLASSI RURALI ITALIANE*. 503 pp., illus. Bari and New Haven.

(16) SULLAM, VICTOR B.

1943. *FUNDAMENTALS OF ITALIAN AGRICULTURE*. *Foreign Agr.* 12: 266-268, illus.

(17) VACIRCA, ANTONIO.

1937. *L'AGRICOLTURA SICILIANA NELLA ZONA ARIDA*. *I Georgofili* [Firenze] (6) 3: [247]-264.

(18) VITALI, GIOVANNI.

1937. *IL PROGRESSO DELL'AGRICOLTURA E LA MECCANICA AGRARIA IN ITALIA*. *Ital. Agr.* 74: [397]-400.

(19) ———

1939. *L'AUTARCHIA E LE FORZE MOTRICI NELL'AGRICOLTURA ITALIANA*. *I Georgofili* [Firenze] (6) 5: [243]-265, illus.

Wartime Shifts in Latin American Agriculture

by JOHN J. HAGGERTY*

Agriculture in the other American Republics varies between hand-labor subsistence farming and large-scale operations frequently financed with foreign capital, producing for export. Although these countries as a whole have had relatively little military contact with the war, its impact upon their national economies has been considerable—especially in those countries largely dependent upon export markets for their principal agricultural products. Enterprises producing commodities with a high war priority have enjoyed an export boom, whereas those producing low-priority items have experienced shrinking outlets. In most countries imports of food and other essential supplies have been inadequate. The outstanding wartime agricultural developments have been an increased emphasis on food production in those areas normally dependent upon imported supplies and, in some tropical areas, greater attention to an expansion in the output of tropical products that formerly entered world markets chiefly from the Far East.

The post-war outcome of these shifts will depend on foreign as well as domestic developments. The trade policies of major industrial European nations, which normally are the chief importers of food and raw materials, will be important, if not the controlling, factors. In general, it may be said that the impact of war upon Latin American agriculture has resulted in increased governmental attention to the strengthening and broadening of economic bases of the national economies, including improvement in agricultural development. In most instances, such changes as have occurred have been in directions already favored by established governmental policies and have progressed at accelerated rates because of the war.

Mexico and Central America

The situation in Mexico has been somewhat unique because of its close proximity to and its rail connections with the markets of the United States. The more important agricultural exports, notably henequen from Yucatán, live cattle from the north, fresh vegetables from the northwest coast, coffee from the southwestern highlands, and bananas from the Isthmus of Tehuantepec, have enjoyed a favorable United States market and have tended to expand. At the same time, through the increased general prosperity flowing from these sources and from Mexico's growing industrial development, consumption demand has exerted increasing pressure on the basic food supply.

Efforts of the National Government, therefore,

have been intensified in the direction of increasing production of such basic commodities as corn, wheat, rice, oilseeds, malting barley, and sugar. The national irrigation program has been intensified; special programs have been established to procure and distribute modern farm machinery and power equipment; and in numerous related ways the Government has striven to advance the modernization of Mexico's agriculture.

These efforts have met with some degree of success. The production of oilseed crops in particular has been increased to almost five times the pre-war volume. Substantial increases in the outturn of corn, wheat, rice, and malting barley have also occurred. Sugar-cane production, which is concentrated in the Gulf-coast area in the State of Veracruz, has been increased by more than half. Since sugar is almost in the luxury class in Mexico, the increased demand resulting from current relative prosperity has been even greater. If production should continue to increase as in recent years, Mexico will probably reach self-sufficiency in this product.

The outstanding aspects of the emerging agricultural pattern in Mexico are: Increased national self-sufficiency in basic agricultural products, including a number formerly imported in large volume, such as edible oils and wheat; more pronounced regional specialization within the country along lines already well-established; and, finally, a stronger compulsion to export specialty products, such as fresh vegetables, henequen, and bananas.

No significant changes in basic patterns are readily apparent in the agriculture of the six Central American Republics. These countries, with the exception of Panama, are generally self-sufficient in food production, except for wheat flour and fats and oils, all of which are customarily obtained chiefly from the United States. The main commercial crops entering export channels are coffee, bananas, and cacao. During the war years, previously established trends toward increased production of general food crops have been somewhat accelerated through augmented governmental efforts but without significant change in production patterns. Each of these countries has approached or achieved self-sufficiency in rice production, and has reduced its dependence upon outside sources for fats and oils and wheat flour.

*Office of Foreign Agricultural Relations.

The banana industry, important in the economies of all Central American countries, except El Salvador, has been hard hit by restrictions on shipping and scarcity of materials needed to combat the sigatoka disease. Prospects appear good for recovery of the industry after the war, with the probable exceptions of Nicaragua and the Atlantic coastal region of Costa Rica, where plantings have been virtually abandoned. Coffee exports, on the other hand, have been maintained under the Inter-American Coffee Agreement and during the war have sustained the economies in which coffee is important. Cacao production and exports, likewise, have been little changed.

In Nicaragua, and to a lesser extent in the neighboring countries, sesame production has been substantially increased as a source of edible oil. In spite of a chronic deficit in oil crops, Nicaragua exports a large proportion of the sesame crop to Costa Rica, where crushing facilities are more readily available.

Panama, unlike the other Central American countries, is traditionally dependent upon imports for a large part of its food supply. Even though food production has been stepped up in response to wartime Government efforts, import requirements have increased because of population expansion and enhanced purchasing power.

Possibly the most significant wartime development in this region will prove to be the production of abacá. Starting from pre-war experimental plantings of the United Fruit Company in the Almirante district in the Republic of Panama, the acreage has now been expanded to more than 29,000 acres in Costa Rica, Guatemala, Honduras, and Panama. These plantations are currently producing high-quality fiber at the estimated rate of one-half million pounds a week. Estimates indicate that these sources in 1945 can supply about 20,000 tons of fiber, or one-half of the normal annual requirements of the United States for cordage during the pre-war decade.

Cuba and Hispaniola

Cuba's main industry, the production of sugar, has been stimulated by the war since important producing areas of the Far East have been shut off as a source of United Nations supply. Virtually the entire exportable supply has been contracted to the United States annually, beginning with 1942. In consequence, both the quantity and value of Cuba's sugar production and exports have reached a high point for recent years, bringing relative prosperity to the island. This fact has affected the basic food supply in two significant ways; first, the diversion of labor, materials, or land from sugar into other

food lines has become difficult, and, second, the increased general prosperity has created a substantially greater demand for food of a wider variety.

Determined governmental efforts have brought about some increases in the production of such crops as corn, rice, and beans, and a moderate increase in the production of beef. The production of peanuts for oil has been increased approximately sevenfold over the 5-year pre-war average. Black beans, an important item in the Cuban diet, are now produced in adequate supply to meet domestic needs. While some increase in rice production has occurred, Cuba still depends on imports for approximately 90 percent of its requirements of this commodity. In general, the war has not brought hardship to Cuba from the standpoint of food. On the contrary, improved standards of living resulting from better incomes, broadly distributed, have meant an improvement in diet with definite shifts in dietary habits.

The post-war economic situation in Cuba will depend, as in the past, on the world sugar situation. Cuba continues to rely upon imports for essential supplies of wheat flour, lard, rice, dry beans, peas, and some potatoes. These supplies flow for the most part from the United States, where the all-important Cuban sugar crop finds its chief market. So far as other important foods are concerned, including meat and dairy products, it seems reasonably certain that the Cuban demand for these products, which has been substantially increased during the war years, will continue if it can be implemented by money income derived largely from sugar. While domestic production of both meats and dairy products has been on the increase, demand appears likely to outrun domestic production if the sugar market holds up.

Haiti and the Dominican Republic, having essentially subsistence systems of farming, are not important suppliers in the world food market, nor do they depend heavily upon imports for food supply. Small but essential imports of flour, fats, meats, dried fish, and dairy products are normally obtained from abroad, chiefly from the United States. The Dominican Republic exports sugar and cacao, and, since the war, has contributed to the Caribbean area supplies of cattle, poultry, butter, eggs, dry beans, and truck crops. Haiti exports coffee, sugar, and sisal. Both countries have increased rice production to the point where small annual exports are made, in contrast with their pre-war status as importers.

Wartime shifts in Dominican agriculture have not been large. In Haiti, the experiment with *Cryptostegia* as a source of latex produced a temporary change in the basic pattern of subsistence farms, but this pattern is currently being reestablished. Per-

haps the most significant wartime development has been the expansion of rice production to an export basis. While these countries seem unlikely to be able to hold their present position in the export market after lower cost rice-producing areas again enter the field, they may endeavor to maintain their self-sufficiency in this product more nearly than in the past. The Haitian banana industry, for a time drastically reduced by lack of shipping facilities, is already showing signs of recovery.

Northwestern South America

The submarine campaign in the Caribbean and the scarcity of shipping stimulated the efforts of Venezuela, Colombia, and Ecuador to increase national production of the basic food crops. These countries have not as yet been able to achieve self-sufficiency in bread grains, fats, and oils, although substantial increases have been accomplished in the production of these and a wide range of food crops.

In Colombia, as elsewhere, the coffee producers have enjoyed a relatively ready market, with about three-fourths of available stocks moving into export channels under the Inter-American Coffee Agreement. Colombia's banana production, concentrated in the Santa Marta zone on the Caribbean coast, has been largely abandoned since early 1942 but is likely to be reestablished after the war in view of certain natural advantages in this area for banana production. In the meantime, the National Government has tried by various means to encourage the production of general food crops in the Santa Marta area, primarily to provide subsistence for an otherwise stranded population. These efforts, however, have met with only indifferent success.

Colombia's sugar production, concentrated chiefly in the Cauca Valley, has been increased approximately to a net import-export balance. Efforts to attain self-sufficiency in rice, corn, wheat, and the oil-seeds have met with substantial success but have not completely eliminated the necessity for occasional imports. In the case of wheat, for example, about 20 percent of requirements are imported, and recently a relaxation of restrictions upon imports has been found necessary in order to assure the millers adequate supplies for blending with native wheat.

In general, the policies of Colombia concerning agriculture have tended to offer more protection to producers than those of many other Latin American countries. Production incentives in the form of price-support measures and direct restriction of imports have been important factors in such expansion as has been achieved.

Ecuador's production and exports of rice and cacao have been substantially expanded during the war years. The rice has moved, for the most part, to neighboring countries and to the Caribbean area. At the same time, however, there have been periods of scarcity in general foodstuffs, aggravated by inflationary prices. There is no ready evidence to suggest that significant changes in land use, from the production of staple food crops for home use to those primarily for export, have occurred. Perhaps a more important factor in food scarcity, though one not susceptible of ready measurement, has been the diversion of agricultural labor from normal farm activity to the production or gathering of cinchona, balsa, and other critical war commodities.

For many years, Venezuela has needed to import much of its food requirement, and, since the rise of its petroleum industry, this need has been intensified. Some slight increases in food production have been accomplished during the war. Sugar production is now not only sufficient for home use, but estimates for 1944 indicate a surplus. Rice production has been trebled from the pre-war average, but Venezuela still imports almost half of its rice requirements. The output of potatoes has been quadrupled, and Venezuela is now independent of outside sources, except for seed potatoes. Coffee and cacao are Venezuela's major agricultural exports. The exportation of these commodities has been promoted by the Government through means of fixed favorable exchange ratios. Venezuela's efforts to encourage expanded food production have not been able to overcome the fundamental fact that a large part of the food-producing farms in the country are located on steep, eroded hillsides and are operated under primitive systems of farming. Some advancement, however, appears to have been made during the war years, but substantial improvement will require attention to the more fundamental problems of land tenure and utilization.

Brazil

Brazil, in itself a region, is largely self-sufficient in the production of foodstuffs as measured by the current dietary standards of the country. Commodities of which Brazil appears likely to continue to have exportable surpluses are coffee, of which it is the world's chief supplier; cacao; oranges; mandioca; and rice. Substantial quantities of beef are also exported. The one major food import is wheat, obtained chiefly from Argentina. Within the country, however, both deficit and surplus areas exist. The southern coastal States of São Paulo and Rio Grande

do Sul, together with inland Minas Gerais, comprise the most important food-producing regions. The very dependent north Brazil and Amazon regions and the States of the northeast, which, despite surpluses of such foods as sugar and cacao, lack self-sufficiency in many others, draw upon the surplus States for many foodstuffs. Domestic transportation and storage facilities normally are among the chief factors limiting the quantity of food supplies from the southerly States to deficit areas. On the whole, local food shortages seem to stem primarily from problems of location and distribution, rather than from fundamental lack of national production.

The chief wartime changes in Brazilian food production are seen in curtailment of citrus fruits for export and increases in the production of sugar, mandioca, and cottonseed. The last-mentioned is a byproduct of cotton-fiber production, which the National Government has been encouraging through a program of guaranteed prices. Little change is evident in the production of other basic food crops. In the early war years through 1942, the slaughtering of beef for export was unusually heavy in response to attractive prices in the export market. More recently, however, the Brazilian Government has taken measures to restrict exports in order to protect the domestic consumer and to prevent too great a reduction in cattle through excessive slaughter.

West-Coast Region

Although the Government of Peru has put forth a great effort to enhance food production during the war years, available evidence indicates that gains have been only moderate in some lines, whereas in others actual decreases have occurred. Rice alone shows substantial expansion in production. In this commodity, Peru has succeeded in eliminating imports which averaged over 22,000 short tons annually in recent pre-war years. Although wheat production has been augmented by about 10 percent from the pre-war average, Peru is still dependent on outside sources for well over half its wheat and flour needs. Production of sugar, the chief export crop, has also increased about 10 percent. Most of the exports since 1941 have gone to Chile and Uruguay.

In practically all other food lines, including meats, butter, eggs, and oils, production has tended to fall off, with consequent increases in import requirements. The fats and oils situation reflects efforts of the Government to curtail cotton production in accordance with an agreement with the United States. Normally, Peru supplies the bulk of its edible-oil requirements from domestic production, chiefly of cotton-

seed oil, but supplements domestic supplies by imports of peanut oil, lard, and sesame oil. Even though the peanut acreage has been greatly expanded and crushing facilities increased, the substantial curtailment of cottonseed production has made necessary greatly expanded imports of other fat and oil commodities, chiefly hog lard.

While Peru is expected to continue its efforts to achieve a greater independence in food supply, the outlook is for substantial food imports for a long time to come. The major wartime shift in land use is from cotton to flax for fiber. Peru may not be able to hold its place as a flax producer against European competition after the war, in which event these lands may be expected to revert to cotton production, or possibly to other high-intensity crops.

Bolivia has to import much of the food required by mine workers and city dwellers and has no significant food products for export. About two-thirds of the country's population live on the land and depend on it for all or a large part of what they consume. Nuts, only part of which are for consumption as foodstuff, are the chief net export item of a food nature. Annual exports of nuts, chiefly of the Brazil and palm types, for the 5-year period 1936-40, averaged about 3,300 short tons. England normally takes about half of Bolivia's nut exports, and the United States, a fifth. While some cattle are exported, far more are imported.

Bolivia's typically net-import food items are wheat (grain and flour), sugar, live meat animals and prepared meats, rice, edible fats and oils, barley, and a scattering of other foods. Argentina ordinarily dominates as a source of supply, with Peru and Chile furnishing most of the remainder.

Although dependable statistics are unavailable, food production in Bolivia appears not to have been materially increased in the war years. Overconcentration of farm population in long-established agricultural areas, reliance chiefly on primitive farming methods, greater inducements offered to laborers for work in the mines, and lack of suitable transportation to open new fertile areas are among the chief obstacles. Being so predominantly on an import basis for food, Bolivia has undoubtedly felt the pinch of war to a greater degree than most of its neighbors. High costs and outright scarcities of food commodities have added to the difficulties of living.

Chile is largely self-sufficient in food production. Normally lentils are exported to European countries, as are dried beans and peas, many fruits, and wine. Rice production since the war has reached a level permitting its export. The most important food import is sugar, chiefly obtained from Peru.

Normally, about 10,000 tons of mutton are exported to Britain annually, chiefly from the Magallanes area in the extreme south. These exports are accounted for in part by receipts of Argentina-produced sheep slaughtered in Chilean plants, because they are more readily accessible and more convenient. Chile is also increasingly dependent upon outside sources for part of its beef supply. In the 5 pre-war years, more than 10 percent was obtained in the form of live cattle shipped in from Argentina. These shipments are increasing in volume during the war years.

Among significant wartime changes are the moderate reduction in production of fruits and lentils normally destined for the European market and a substantial increase in the outturn of rice. Chile formerly imported more than half its domestic requirements of rice, but production in 1944 apparently will permit substantial exports. Oilseeds are also being produced in increasing quantities to make up for important supplies cut off by the war.

The post-war adjustments are not expected to be severe, since the home market rather readily absorbs the greater part of the increased food production. Whether Chile can hope to maintain its present export position in rice appears doubtful. Similarly, domestic producers of oilseeds may not be able to hold their home market when more favored varieties of edible oils again become available from foreign sources. The shifts to other crops which would be entailed need not be difficult, however, in either case.

Río de la Plata Region

In the Río de la Plata region, grain production for export has slacked off, and the livestock industry has prospered. The sustained United Nations market for beef, mutton, and other livestock products has not only supported the livestock industry but, through higher prices, has also tended to promote expansion. At the same time, domestic demand for meats has also been rising, especially in urban centers where expansion of industrial activity has occurred.

The most pronounced tendencies, therefore, have been to shift from production of grains for export to production of livestock. Notable increases have also

occurred in acreage and production of vegetable-oilseed crops, especially sunflowers, to replace customary imports of olive oil from southern Europe and coconut oils from the Far East.

The food situation in Argentina is normally characterized by export surpluses in all the major categories, particularly grains, meats, and dairy products. The chief import requirements are coffee, yerba maté, and dried and fresh fruit at certain seasons. Argentina is in fact one of the principal surplus food-producing areas of the world, and its economy is dependent to a large extent on the export market for surplus production of food and feed. Wheat and corn are normally produced largely for export, only a relatively small proportion of the total production being consumed domestically. With meat, on the other hand, a much larger percentage is normally consumed within the country.

Because of the sustained United Nations market for livestock products of all types, all groups connected with this industry have enjoyed relative prosperity. The cutting off of European markets for a large part of Argentina's grain products, however, presented a major crisis for the crop producers and, because of their predominance in the national economy, for the country as a whole. The Government aided the situation by strengthening price-support programs and by complementary regulatory measures. The use of corn, flaxseed, linseed oil, and wheat for fuel, under Government regulation and controlled prices, provided one emergency outlet for accumulating grain stocks. Another significant development has been the increased feeding of grains, especially in connection with the expanding production of pork. Recent droughts have diminished the pressure of surpluses. However, large accumulations of wheat, at least, in Government hands are available for the world market whenever conditions permitting their export are restored.

Expansion in the sunflower acreage for increased production of edible oil has been one of the more striking developments. A more important question for the future, nevertheless, concerns the prospects for maintaining the augmented pork industry as an outlet for the great crop, corn. The natural factors affecting production in Argentina's great central

grain belt would seem to suggest a development not unlike that of the United States Corn Belt. The process, however, may be delayed or impeded by reluctance of the larger landowners to give up established practices. Probably the controlling factor, however, will be found in the import policies of European nations to which Argentina must look for its export outlets for pork.

Meat dominates Uruguayan food exports in value, with all animal products, including wool, hides, and some live cattle, constituting about 90 percent of Uruguay's total exports in normal years. Most of the meat exported during the war has gone to the United Kingdom. Uruguay also produces surplus wheat, part of which is exported in the form of flour. Minor exports in normal times include flaxseed, poultry and eggs, and some fruit and vegetables. Sugar and yerba maté comprise most of the Uruguayan food imports. Before the war, sugar came from overseas and from Peru, but Argentina and Brazil have now largely replaced overseas sources. Brazil regularly supplies nearly all the yerba maté imported.

There has been but little change, on the whole, in Uruguay's food production since 1939. With livestock husbandry so dominant in the economy, and with prevailing excellent prices for wool and meats, there has been little or no incentive for the wealthy *estancieros* to change the nature of their agricultural operations. One change worth mentioning, however, has been the trebling of production of edible

oils, making the country self-sufficient in this respect. The Government, while perhaps not so active in stimulating food production for domestic use, as have been the governments of many other countries, has exerted a substantial effort to obtain imports from the United States and other Western Hemisphere countries to replace sources cut off by war.

Food production in Paraguay has made notable advances, under strong Government direction, during the war years. Meats, which are the chief export, and which are highly important in the domestic diet, have been increased most markedly. Slaughter in 1943 was almost double the pre-war 5-year average, and exports, in consequence, increased fourfold over the same period. The upward trend in sugar production of recent years had advanced sufficiently to enable Paraguay to export a small tonnage in 1941. Unfavorable crop conditions reduced yields both in 1942 and in 1943, probably necessitating small net imports in 1944.

Rice production, though not important in the domestic diet, has been almost trebled in volume over the pre-war 5-year average, permitting small exports in 1943. Mandioca is the all-important starchy food in the native diet. Its production is normally adequate to meet requirements but has been stepped up to compensate for reduced supplies of flour imported from Argentina. Paraguay has substantially increased its annual output of oilseeds and expanded corn and wheat production.

New Bulletin

The Livestock of China ¹

by Ralph W. Phillips, Ray G. Johnson, and Raymond T. Moyer

This publication may be of interest to readers of FOREIGN AGRICULTURE for its summary of existing information with regard to livestock in China, prepared particularly for the use of those concerned with the development of Chinese livestock and their products. Livestock raising is the principal industry of the nomadic and seminomadic groups which inhabit the outlying territories of China, but the larger part of China's total livestock is raised by farmers in the more densely populated inner regions as an adjunct to their main business of raising crops. Of the animals used for work purposes, donkeys, cattle, mules, and horses are the most common types in north and northwest China; the water buffalo and cattle are the

main types in the rice-growing regions of central and southeast China. Swine and poultry are important forms of livestock in all parts of China, and large numbers of sheep and goats are raised in the north and northwest. Commercial dairying is of importance only around a few of the larger cities.

The breeds used in China would be considered unproductive from a Western point of view, but they are able to survive and to contribute products acceptable to the Chinese taste, even though raised under a poor environment. Active livestock-improvement programs have not yet been undertaken in either the farming or the pastoral area, and knowledge of scientific methods of breeding, feeding, and management is limited among the rural population. Present indications are that the production of meat, milk, and wool could be increased and more draft power obtained from the livestock industry with the introduction of improved practices.

¹ U. S. Dept. State Pub. 2249 (Far East. Ser. 9), 174 pp., illus. For sale, 30¢ per copy, by Supt. of Documents, Government Printing Office, Washington 25, D. C.